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EXAMINER

DUONG, THOI V

ART UNIT

PAPER NUMBER

2871

DATE MAILED: 07/21/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/704,745

Applicant(s)

KWON ET AL.

Examiner

Thoi V Duong

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 02 June 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-15 and 17-23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15 and 17-23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

**DETAILED ACTION**

1. This office action is in response to the RCE, Paper No. 12, filed June 02, 2003.

Accordingly, claims 1, 7, 8, 10 and 15 were amended and claim 16 was cancelled. Currently, claims 1-15 and 17-23 are pending in this application.

2. Applicant's amendment with respect to claims 1, 7, 8, and 10 are moot in view of the new ground(s) of rejection.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 2 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hall (USPN 5,841,494) in view of Jones et al. (USPN 5,963,284) and Kaneko et al. (USPN 6,295,108 B1).

As shown in Fig. 6, Hall discloses a liquid crystal display (LCD) usable with a back light source 11 supplying light, comprising:

a cholesteric liquid crystal (CLC) polarizer 17 to transmit one of left-circularly polarized light and right-circularly polarized light from the back light source, and to reflect other light not transmitted;

a lower substrate 6 on which a CLC color filter layer 20 is formed to transmit the circularly polarized light from the CLC polarizer having certain wavelengths and reflects other light not transmitted (col. 7, lines 18-41);

a liquid crystal layer 4 to selectively revolve a polarized direction of the circularly polarized light from the CLC color filter layer (col. 7, lines 18-41); and  
an upper substrate over the liquid crystal layer.

Hall discloses a LCD that is basically the same as that recited in claims 1, 2 and 17 except for a hologram diffuser and a linear polarizing transformer. As shown in Fig. 7, Jones discloses a LCD comprising an upper substrate 17 over a liquid crystal layer 11, a hologram diffuser disposed below the upper substrate, wherein the hologram diffuser diffuses light without altering a polarization of the light (col. 5, lines 30-65), and a planarization layer 15 disposed on the hologram diffuser to planarize the hologram diffuser. Meanwhile, as shown in Fig. 1, Kaneko discloses a LCD comprising a linear polarizing transformer consisting of an upper linear polarizer 8 and a compensating film 13 (quarter-wave film) to transform light into linearly-polarized light. Kaneko also discloses that a plurality of retardation films can be used to obtain more linearly polarized light, providing more favorable colored display (col. 8, lines 59-64). Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the LCD of Hall with the teaching of Jones and Kaneko by forming below the upper substrate a hologram diffuser to diffuse the revolved circularly polarized light from the liquid crystal layer and forming a linear polarizing transformer to transform the diffused circularly polarized light from the hologram diffuser into linearly polarized light so as to obtain a maximum contrast ratio and a maximum brightness for the display.

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5. Claim 18 rejected under 35 U.S.C. 103(a) as being unpatentable over Hall (USPN 5,841,494) in view of Jones et al. (USPN 5,963,284) and Kaneko et al. (USPN 6,295,108 B1) as applied to claims 1, 2 and 17 above and further in view of Abileah et al. (USPN 5,629,784).

The LCD of Hall as modified in view of Jones and Kaneko above includes all that is recited in claim 18 except for a collimating member disposed below the lower substrate to collimate the light supplied by the back light source and direct it toward the CLC polarizer. As shown in Fig. 2, Alibeah discloses a back light assembly 2 for using with a LCD display, comprising a back light 29, a reflecting plate 27 and a collimating member 23 to collimate the light supplied by the back light. Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the LCD of Hall with the teaching of Alibeah by employing a back light assembly comprising a reflecting plate and a collimating member to collimate the light supplied by the back light source and direct it toward the CLC polarizer so as to improve illumination intensity and minimize power consumption and thermal inconveniences.

6. Claims 3-6, 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tedesco (USPN 5,418,631) in view of Davis et al. (USPN 5,822,029) and Abileah et al. (USPN 5,629,784).

As shown in Fig. 3, Tedesco discloses a LCD usable with a back light source 16 supplying light, comprising:

a cholesteric liquid crystal (CLC) polarizer 102 to transmit one of left-circularly polarized light and right- circularly polarized light from the back light source, and to reflect other light not transmitted (col. 4, lines 42-53);

a linear polarizing transformer including a first linear polarizer 124 and a quarter-wave film 122 to transform the circularly polarized light from the CLC polarizer into linearly- polarized light (col. 4, lines 62-68);

a liquid crystal laver 126 above the first linear polarizer and to selectively transmit the linearly-polarized light.

Tedesco discloses a LCD that is basically the same as that recited in claims 3-6, 8, 19, 20 and 23 except for a CLC color filter layer and a hologram diffuser. As shown in Fig. 1, Davis discloses an illumination system comprising a circular polarizer which transmits the circularly polarized light from a light source 10 and a CFC color filter 18 which transmits the circularly polarized light from the circular polarizer having certain wavelengths and reflects other light not transmitted (col. 2, line 38 through col. 3, line 6). Meanwhile, Abileah discloses in Fig. 3 a LCD usable with a backlight source 29, comprising a collimating member 23 to collimate the light supplied by the backlight source, a first (back) linear polarizer 3, a liquid crystal layer 9 above the first linear polarizer to selectively transmit the linearly-polarized light, and an upper substrate 13 over the liquid crystal layer having a hologram diffuser 21 for diffusing the linearly-polarized light from the liquid crystal layer, and a second (front) linear polarizer 15 to transform the diffused linearly polarized light from the hologram diffuser into linearly

polarized light. A planarization layer 35 to planarize the hologram diffuser is illustrated in Fig. 2.

As to the product-by-process limitations “hardened by light irradiation” of claim 4 and “a direct coating polarizer” of claim 5, it has been recognized that “Even through product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior art product was made by a different process”. *In re Thorpe*, 227 USPQ 964,966 (Fed. Cir. 1985). See also MPEP 2113.

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the LCD of Tedesco with the teachings of David and Abileah by forming a CLC color filter between the CLC polarizer and the first linear polarizer and an upper substrate having a hologram diffuser so as to obtain high contrast ratio images.

7. Claims 7, 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tedesco (USPN 5,418,631) in view of Jones et al. (USPN 5,963,284).

As shown in Fig. 3, Tedesco discloses a LCD usable with a back light source 16 supplying light, comprising:

a cholesteric liquid crystal (CLC) polarizer 102 to transmit one of left-circularly polarized light and right-circularly polarized light from the back light source, and to reflect other light not transmitted (col. 4, lines 42-53);

a quarter-wave film 122 to transform the circularly polarized light from the CLC polarizer into linearly-polarized light (col. 4, lines 62-68);

a linear polarizer 124 above the quarter film;

a lower substrate 25 above the linear polarizer;

a liquid crystal layer 126 above the lower substrate; and

an upper substrate 24 over the liquid crystal layer.

Tedesco discloses a LCD that is basically the same as that recited in claims 7, 21 and 22 except for a hologram diffuser to diffuse the linearly- polarized light from the liquid crystal layer. As shown in Fig. 7, Jones discloses a LCD comprising a first (back) linear polarizer 1 below a lower substrate 3; a liquid crystal layer 11 above the first linear polarizer to selectively transmit the linearly-polarized light; a hologram diffuser 61 (or photo-imaged light diffuser) over the liquid crystal layer; an upper substrate 17 over the hologram diffuser to diffuse the linearly- polarized light from the liquid crystal layer; and a planarization layer 15 disposed on the hologram diffuser to planarize the hologram diffuser; and an absorbing type color filter layer 65 disposed above the liquid crystal layer.

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the LCD of Tedesco with the teaching of Jones by forming below the upper substrate a hologram diffuser to diffuse the linearly-polarized light from the liquid crystal layer so as to obtain high contrast ratio images.



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8. Claims 10, 11 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hall (USPN 5,841,494) in view of Jones et al. (USPN 5,963,284) and Abileah et al. (USPN 5,629,784)

As shown in Fig. 6, Hall discloses a liquid crystal display (LCD) usable with a back light source 11 supplying light, comprising:

a cholesteric liquid crystal (CLC) polarizer 17 to transmit one of left-circularly polarized light and right-circularly polarized light from the back light source, and to reflect other light not transmitted;

a lower substrate 6 above the CLC;

an upper substrate above the lower substrate;

a liquid crystal layer 4 disposed between the ; and

a CLC color filter layer 20 is formed to transmit the circularly polarized light from the CLC polarizer having certain wavelengths and reflects other light not transmitted (col. 7, lines 18-41);

Hall discloses a LCD that is basically the same as that recited in claims 10, 11 and 14 except for a hologram diffuser, a linear polarizing transformer disposed on the upper substrate, and a collimating member. As shown in Fig. 7, Jones discloses a LCD comprising an upper substrate 17 over a liquid crystal layer 11, a hologram diffuser disposed below the upper substrate, wherein the hologram diffuser diffuses light without altering a polarization of the light (col. 5, lines 30-65), and an upper linear polarizer 19 above the upper substrate and polarizing the diffused light from the holographic diffuser. Meanwhile, as shown in Fig. 2, Alibeah discloses a back light assembly 2 for using with

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a LCD display, comprising a back light 29, a reflecting plate 27 and a collimating member 23 to collimate the light supplied by the back light. Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the LCD of Hall with the teaching of Jones by forming below the upper substrate a hologram diffuser to diffuse the revolved circularly polarized light from the liquid crystal layer and a linear polarizing transformer to transform the diffused circularly polarized light from the hologram diffuser into linearly polarized light so as to obtain a maximum contrast ratio and a maximum brightness for the display. Also, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the LCD of Hall with the teaching of Alibeah by employing a back light assembly comprising a reflecting plate and a collimating member so as to improve illumination intensity and minimize power consumption and thermal inconveniences.

9. Claims 13 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hall (USPN 5,841,494) in view of Jones et al. (USPN 5,963,284) and Abileah et al. (USPN 5,629,784) as applied to claims 10, 11 and 14 above and further in view of Kaneko (USPN 6,295,108 B1).

The LCD of Hall as modified in view of Jones and Abileah above includes all that is recited in claims 13 and 15 except for a quarter-wave film disposed below the upper linear polarizer to transform the circularly polarized light of the predetermined direction into linearly-polarized light and a compensating film disposed between the quarter-wave film and the upper linear polarizer to transform light into linearly-polarized light. As shown in Fig. 1, Kaneko discloses a LCD comprising an upper linear polarizer 8 and a

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compensating film 13 (quarter-wave film) to transform light into linearly-polarized light. Kaneko also discloses that a plurality of retardation films can be used to obtain more linearly polarized light, providing more favorable colored display (col. 8, lines 59-64). Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the LCD of Hall with the teaching of Kaneko by forming a quarter-wave film disposed below the upper linear polarizer and a compensating film between the quarter-wave film and the upper linear polarizer so as to improve viewing angle characteristic.

10. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hall (USPN 5,841,494) in view of Jones et al. (USPN 5,963,284) and Abileah et al. (USPN 5,629,784) as applied to claims 10, 11 and 14 above and further in view of Davis et al. (USPN 5,822,029).

The LCD of Hall as modified in view of Jones and Abileah above includes all that is recited in claim 12 except for an absorbing type color filter layer. As shown in Fig. 2, Davis discloses a color filter 18 which is arranged to absorb light having a wavelength falling outside a predetermined band so as to reduce problems associated with light from outside (col. 4, lines 5-25). Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the LCD of Hall with the teaching of Davis by employing an absorbing type color filter layer so as to obtain clearer images for the display.

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11. Claims 8 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hall (USPN 5,841,494) in view of Jones et al. (USPN 5,963,284), Kaneko et al. (USPN 6,295,108 B1) and Abileah et al. (USPN 5,629,784).

As shown in Fig. 6, Hall discloses a liquid crystal display (LCD) usable with a back light source 11 supplying light, comprising:

a cholesteric liquid crystal (CLC) polarizer 17 to transmit one of left-circularly polarized light and right-circularly polarized light from the back light source, and to reflect other light not transmitted;

a lower substrate 6 on which a CLC color filter layer 20 is formed to transmit the circularly polarized light from the CLC polarizer having certain wavelengths and reflects other light not transmitted (col. 7, lines 18-41);

a liquid crystal layer 4 to selectively revolve a polarized direction of the circularly polarized light from the CLC color filter layer (col. 7, lines 18-41); and

an upper substrate over the liquid crystal layer.

Hall discloses a LCD that is basically the same as that recited in claim 1 except for a hologram diffuser, a linear polarizing transformer, and a collimating member. As shown in Fig. 7, Jones discloses a LCD comprising an upper substrate 17 over a liquid crystal layer 11, a hologram diffuser disposed below the upper substrate, wherein the hologram diffuser diffuses light without altering a polarization of the light (col. 5, lines 30-65), and a planarization layer 15 disposed on the hologram diffuser to planarize the hologram diffuser. Meanwhile, as shown in Fig. 1, Kaneko discloses a LCD having a linear polarizing transformer comprising an upper linear polarizer 8 and a compensating

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film 13 (quarter-wave film) to transform light into linearly-polarized light. Furthermore, as shown in Fig. 2, Alibeah discloses a back light assembly 2 for using with a LCD display, comprising a back light 29, a reflecting plate 27 and a collimating member 23 to collimate the light supplied by the back light. Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the LCD of Hall with the teaching of Jones and Kaneko by forming below the upper substrate a hologram diffuser to diffuse the revolved circularly polarized light from the liquid crystal layer and forming a linear polarizing transformer to transform the diffused circularly polarized light from the hologram diffuser into linearly polarized light so as to obtain a maximum contrast ratio and a maximum brightness at the same viewing polar angle for the display. Also, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the LCD of Hall with the teaching of Alibeah by employing a back light assembly comprising a reflecting plate and a collimating member so as to improve illumination intensity and minimize power consumption and thermal inconveniences.

12. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hall (USPN 5,841,494) in view of Jones et al. (USPN 5,963,284), Kaneko et al. (USPN 6,295,108 B1) and Abileah et al. (USPN 5,629,784) as applied to claims 8 and 23 above and further in view of Kondo et al. (USPN 6,198,520 B1).

The LCD of Hall as modified in view of Jones, Kaneko and Abileah above includes all that is recited in claim 9 except for a CLC color filter including dichromic acid photoinitiator. Kondo discloses a color LCD wherein a photosensitive resist made from

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polyvinylalcohol added with dichromic acid to form color filters of R, G, and B (col. 12, lines 27-38). Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the LCD of Hall with the teaching of Kondo by forming a CLC color filter including dichromic acid photoinitiator so as to obtain a color display exhibiting a wide angle of visibility.

***Conclusion***


13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thoi V. Duong whose telephone number is (703) 308-3171. The examiner can normally be reached on Monday-Friday from 8:00 am to 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim, can be reached at (703) 305-3492.

Thoi Duong



07/13/2003



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